

ROTTBOELLIA COCHINCHINENSIS (POACEAE: ANDROPOGONEAE) NEW TO TEXAS

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ABSTRACT

Rottboellia cochinchinensis (Lour.) W.D. Clayton (syn. = *R. exaltata* L.f.), previously unreported in Texas, has been found in Jefferson County. A key is provided to separate this taxon from similar genera of Texas Andropogoneae, as well as a description of the species.

RESUMEN

Rottboellia cochinchinensis (Lour.) W.D. Clayton (sinónimo de *R. exaltata* L.f.) previamente no citada en Texas, se ha encontrado en el Condado Jefferson. Se ofrece una clave para separar este taxon de géneros similares de Andropogoneae de Texas, así como una descripción de la especie.

Rottboellia L.f. contains four species native to the Old World Tropics which are adapted to a variety of habitats; swamps to dry woodlands and disturbed areas (Clayton and Renvoize 1986). *Rottboellia cochinchinensis* (Lour.) W.D. Clayton (syn. = *R. exaltata* L.f.), native to Southeast Asia, is a large annual that can reach a height of over 3 m and is an aggressive invader of disturbed areas. This species is commonly named "itchgrass" because of the presence of stiff irritating trichomes on the leaf sheaths.

Rottboellia cochinchinensis has been introduced into tropical and subtropical areas of Africa, Australia, Madagascar, West Indies, and North, Central and South America (Holm et al. 1977). In the United States it has been primarily confined to Florida and Louisiana (White et al. 1979; Hall and Patterson 1992), however it has also been reported from Alabama, Georgia, North Carolina (Talpas 1982; Millhollon 1983), Mississippi (Patterson and Quimbly 1978) and Arkansas (Khodayari et al. 1985). It was introduced into the United States at Miami, Florida (Chase 1951) and Louisiana. In Louisiana it was first observed in St. Martin Parish along a railroad track near the town of Ruth after a local flood in 1927 (Millhollon 1965). It is now reported to occur in 16 Louisiana parishes

(Allen et al. 1991). This species has not been reported from Texas (Gould 1975; Hatch et al. 1990; Hall and Patterson 1992).

Rottboellia cochinchinensis, ranked as the 18th worst weed in the world, is a pest of 18 crops in 28 countries (Holm et al. 1977). It is a pest in sugarcane, corn, rice, cotton, peanuts, soybeans, bananas, cassava, citrus, cowpeas, papayas, pineapples and sorghum (Holm et al. 1977). This taxon is listed in the Federal Noxious Weed Act [7 CFR Part 360.200 (C)] and an aggressive pest of crops. It is important to monitor its movement, because of its economic threat.

During a botanical collecting trip in 1989 this taxon was collected in Calcasieu Parish, Louisiana (Wipff 1467, S. & G. Jones, TAES), about five miles from the Texas border. From the distribution given by White et al. (1979) and after obtaining additional distribution information from the Louisiana State University Herbarium (LSU) and Tulane University Herbarium (NO); we determined this collection to be the most western known site at that time. A Noxious Weed Survey, funded by the Texas Agricultural Extension Service in cooperation with the Cooperative Agricultural Pest Survey Program, was conducted in September 1992 to determine the status of *Rottboellia cochinchinensis* in Texas. During this survey a single population was found along the side of State Highway 73 in Port Arthur, Jefferson County. This population contained about 3,000 individuals and extended about 100 m along the side of the highway.

Rottboellia is in the tribe Andropogoneae Dumort. and subtribe Rottboelliinae Presl. This subtribe is delimited in Texas by the following characters: *Inflorescence* a cylindrical to flattened spicate raceme, usually fragile and disarticulating (breaking apart) at maturity (except for *Hemarthria* which does not break apart at maturity); internodes variously thickened or swollen. *Spikelets* paired and usually dissimilar. *Sessile spikelet* bisexual, dorsally compressed, two florets; first glume 2-keeled, convex; lower floret sterile or staminate, awnless; upper floret bisexual, awnless. *Pedicelled spikelet* variable; pedicel free or fused to the central axis internode of the inflorescence. In Texas, the following genera are classified in the subtribe Rottboelliinae: *Coelorachis*, *Elionurus*, *Eremochloa*, *Hemarthria* and *Rottboellia*.

The following is a key to Texas Andropogoneae, subtribe Rottboelliinae and similar genera.

KEY TO TEXAS ANDROPOGONEAE SUBTRIBE ROTTBOELLIINAE AND SIMILAR GENERA

1. Spikelets awned 2
1. Spikelets awnless 4
- 2(1). Awns less than 3 cm long, glabrous (scabrous) *Schizachyrium*
2. Awns more than 3 cm long, at least the lower 1/2 of the awn pubescent 3
- 3(2). Inflorescence (excluding awns) 10–28 cm long; upper nodes densely pubescent; awn light colored, awn pubescence 1 mm or more long *Trachypogon secundus*

3. Inflorescence (excluding awns) 4–7 cm long; nodes glabrous; awn golden brown to dark brown at maturity, awn pubescence less than 1 mm long *Heteropogon*
- 4(1). Spikelets, in the upper 1/2 of the inflorescence, arranged on one side of the central axis of the inflorescence; both spikelets sessile at each node; inflorescence comprised of a spicate raceme or a panicle of 2–3 racemose branches *Tripsacum dactyloides*
4. Spikelets on both sides of the central axis of the inflorescence; spikelets at each node consisting of one sessile and one pedicelled (the pedicelled spikelet is sometimes absent and only the pedicel remains); inflorescence a spicate raceme 5
- 5(4). Inflorescence pubescent *Elionurus*
5. Inflorescence glabrous 6
- 6(5). Pedicelled spikelet slightly shorter to longer than the sessile spikelet; pedicel fused to the central axis internode of the inflorescence 7
6. Pedicelled spikelet less than 1/2 as long (or absent) as the sessile spikelet; pedicel free, not fused to the central axis internode of the inflorescence 8
- 7(6). Sheaths pubescent with stiff, straight, papilla based trichomes up to 3 mm long, which irritate the skin; plants annual, developing prop roots from the lower nodes; inflorescence fragile and breaking apart at maturity; apex of first glume of the pedicelled spikelet bifid *Rottboellia cochinchinensis*
7. Sheaths glabrous; plants perennial, not developing prop roots; inflorescence tough, not breaking apart a maturity; apex of first glume of the pedicelled spikelet not bifid *Hemarthria altissima*
- 8(6). Plants mat-forming, to 30 cm tall; stolons present; dorsal (abaxial) surface of first glume of sessile spikelet smooth *Eremochloa ophiuroides*
8. Plants erect, not mat-forming, 30–130 cm tall; stolons absent; dorsal (abaxial) surface of first glume of sessile spikelet shallowly pitted to coarsely and irregular transverse ridges *Coelorachis*

Rottboellia cochinchinensis (Loureiro) W.D. Clayton, Kew Bull. 35:817. 1981. (Fig. 1). TYPE: Cochin, China (now Vietnam [Hall and Patterson 1992]); whereabouts uncertain (Clayton and Renvoize 1982).

Stegosia cochinchinensis Lour., Fl. Cochin. 1:51. 1790.
Rottboellia exaltata L.f., Suppl. Pl. 114. 1781., non *R. exaltata* (L.) L.f., Nov. Gram. Gen. 23, 37. 1779. TYPE: "In indiis," Thunberg, (HOLOTYPE: LINN; Clayton and Renvoize 1982).

ITCHGRASS. Erect annual, 30–300 cm tall; lower 3–6(7) nodes developing prop roots; *culms* glabrous or sparsely pubescent in upper portion of internode, branching from aerial nodes. *Leaves* cauline; *sheaths* pubescent on back with long, stiff, papilla-based trichomes 1.0–3.0 mm long and irritating the skin; *ligule* a ciliate membrane, 1.0–1.3 mm long, light brown; *blades* flat, (9) 20–50 (60) cm long, 10–20 (25) mm wide, glabrous abaxially; sparsely pubescent with short papilla-based trichomes adaxially, densely pubescent behind the ligule. *Inflorescence* a spicate raceme, (3) 6–15 cm long, 2–3.5 (4.0) mm wide, glabrous; 10–22 internodes, 6.0–12.0 mm long, disarticulation at the nodes at maturity, each internode or article (segments of a structure that separate at maturity) with a

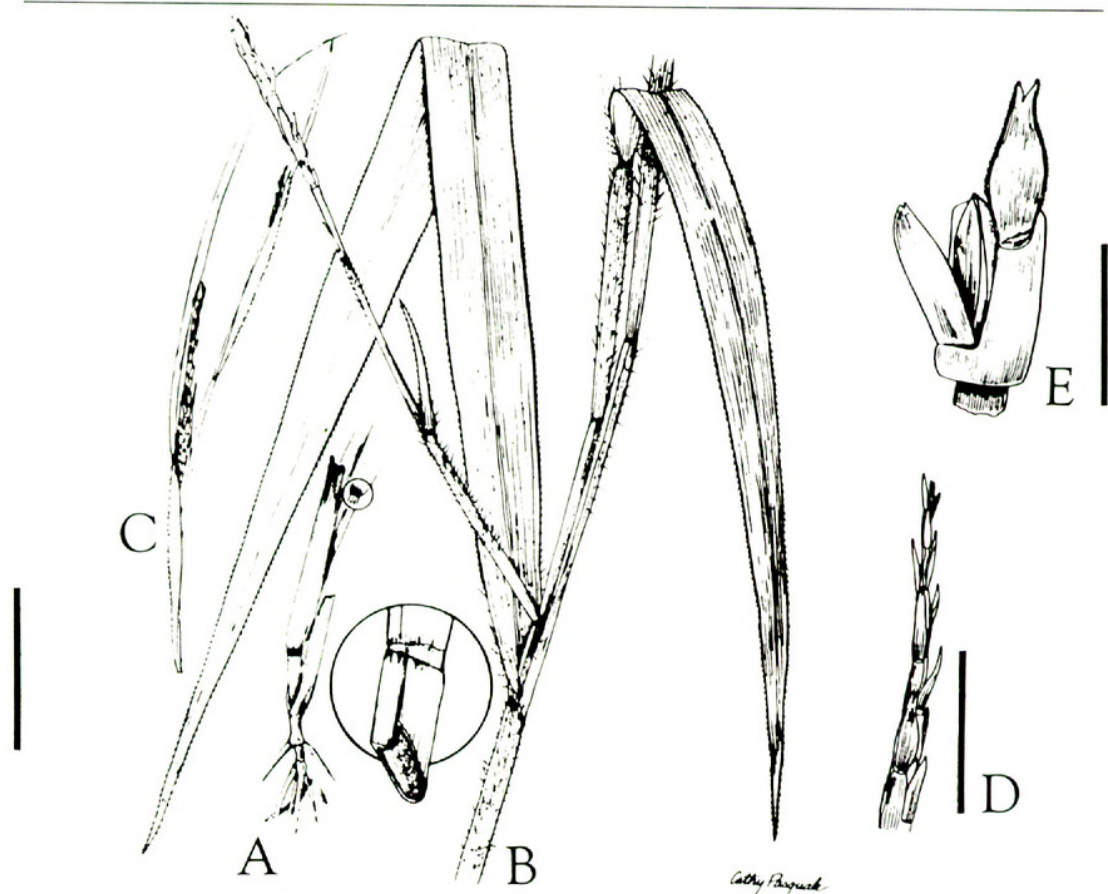


FIG. 1. *Rottboellia cochinchinensis*. Bar equals 4 cm for A–C. A. Lower portion of culm, showing prop roots (with inset showing solid stem); B. Upper portion of culm showing pubescence and spicate raceme; C. Young flowering branch; D. Top portion of inflorescence (Bar equals 1 cm); E. Floral unit [sessile spikelet, pedicellate spikelet, and internode (Bar equals 5 mm)] [modified from Webster (1990); source Williams 2623 (NY)].

prominent basal callus-knob (peg); apex of peduncle expanded; inflorescence terminates in (3) 4–6 reduced spikelets, which become progressively smaller towards the inflorescence apex. *Spikelet*, awnless, two per node, one sessile and one pedicellate; sessile spikelet sunken into a hollow in the central axis internode; *Sessile Spikelets* (3.5) 4.0–6.0 (7.0) mm long, glabrous; *first glume* (3.5) 4.0–6.0 (7.0) mm long, 1.4–2.0 mm wide, 11–13 (–15)-veined with transverse veins at the apex, broadly convex to flat, margins revolute, coriaceous, apex bifid with teeth 0.2–0.6 (0.7) mm long; *second glume* 5.0–6.2 mm long, (–13) 15–17-veined with transverse veins at the apex, navicular (boat-shaped, shaped as the bow of a boat) and almost enclosing the two florets, glabrous, coriaceous. *Lower Floret* staminate, *stamens* 3, 2.2–2.3 mm long, purple/red; *lemma* 4.2–5.1 mm long, 1.2–1.7 mm wide, faintly 3-veined, 2-keeled, hyaline membrane, glabrous; *palea* 4.0–4.6 mm long, 1.2–1.7 mm wide, back coriaceous and margins membranous, glabrous.

Upper floret bisexual, *stamens* 3, 1.2–2.1 mm long, yellow to purple/red; *lemma* 4.0–5.2 mm long, faintly 3-veined; a hyaline membrane enclosing the flower, navicular (boat-shaped, shaped as the bow of a boat), glabrous; *palea* absent. *Stigmas* purple. *Caryopses* 3.0–3.2 (4.0) mm long, 2.0–2.2 mm wide. *Pedicellate Spikelet* (3) 3.5–7.4 (8.0) mm long, neuter; *pedicel* (3) 3.5–6.5 mm long, 1.5–2.2 mm wide, flat, glabrous, fused to central axis internode; *first glume* (3) 3.5–7.4 (8.0) mm long, ca. 19-veined, herbaceous, 2-keeled, flat, antrorsely scabrous on the keels; apex bifid, teeth 0.6–1.1 (1.4) mm long; *second glume* 3.5–4.5 mm long, 5–9-veined, minutely pubescent on back, herbaceous. *Lower floret* neuter, *lemma* 3.0–3.5 mm long, faintly 3-veined, a hyaline membrane; *palea* 0.8–2.0 mm long, 0-veined, a hyaline membrane, glabrous. *Upper floret* neuter, *lemma* 1.6–2.5 mm long, 0-veined, a hyaline membrane, glabrous; *palea* 0.6–1.1 mm long, 0-veined, hyaline membrane, glabrous.

Specimen collected: UNITED STATES. Texas. Jefferson Co.: NW corner of the intersection of FR 823 and Hwy 73 in Port Arthur, disturbed roadside, 24 Sept 1992, Wipff 2459 & E.J. Taylor (BRIT/SMU, TAES, TEX, US). The population starts at the intersection of FR 823 and Hwy 73 and goes W for ca. 100 m along Hwy 73 and has an estimated 3,000 plants. Associated species: *Sorghum halepense* (L.) Pers., *Cenchrus echinatus* L., *C. incertus* M.A. Curtis, *Sporobolus indicus* (L.) R.Br., *Paspalum dilatatum* Poir., *Bothriochloa ischaemum* (L.) Keng and *Cyperus* sp.

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